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EXAMINER

GRAHAM, ANDREW R

ART UNIT PAPER NUMBER

2644

DATE MAILED: 06/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/713,262

Applicant(s)

VAUDREY ET AL.

Examiner

Andrew Graham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/1/04</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) received on March 1, 2004 has been considered by the examiner.

Response to Arguments

2. Applicant's arguments received on 2/23/2005 with respect to claims 1,2, and 4 and the "gain adjusted independently" have been considered but are moot in view of the new ground(s) of rejection. These new grounds have been necessitated by the applicant's amendment.

Applicant's arguments received on 2/23/2005 with respect to the phrase "downmixing" have been fully considered but they are not persuasive.

On page 5, lines 28-29, the applicant has stated, "Each of these mixers is understood to be a combiner circuit that simply combines its respective inputs into a single output. See, e.g., Klayman '976 claim 1". The examiner respectfully disagrees with this interpretation. In regards to the function of the mixers 280,284, Klayman '976 teaches that "one of ordinary skill in the art" could appreciate that "the final ratio of the individual signal strength for the various signals of Figure 8 is also affected by the volume adjustments and the level of mixing applied by the mixers" (col. 12, lines 56-60). Klayman '976 further teaches that various techniques and methods are known in the prior art for mixing multiple multi-channel signals into a two channel

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format. Such techniques include the simple combination of all signals into a two channel format wherein only adjusting the relative gains of the two mixed signals as well as applying frequency shaping, amplitude adjustments, time delays or phase shifts, or some combination of each of these modifications to an individual audio signal during the final mixing process (col. 2, lines 15-25). Accordingly, the mixing process of 280 and 284 is not limited, in view of the teachings of Klayman '976, to the simple summation of the applied input signals.

On page 6, lines 12-28, the applicant argues that "in the pending application and to the those of skill in the art, the term 'downmixing' may refer, for example, to a technique used to transform 5.1 decoded channels into a reduced number of channels with high quality audio" and that "downmixing" refers to a "transformation according to standardized downmix coefficients". The examiner respectfully submits that though this may be the applicant's intended definition of the word "downmixing", such a definition is not clearly set forth in the present application. In the absence of an express intent to impart a novel meaning to the claim terms, the words are presumed to take on the ordinary and customary meanings attributed to them by those of ordinary skill in the art. An applicant is entitled to be his or her own lexicographer and may rebut the presumption that claim terms are to be given their ordinary and customary meaning by clearly setting forth a definition of the term that is different from its ordinary and customary meaning. However, any special meaning

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assigned to a term must be sufficiently clear in the specification that any departure from common usage would be so understood by a person of experience in the field of the invention.

In the present case, the specification discusses "well-specified guidelines for downmixing", per paragraph 0054, but not that these "guidelines" or "standardized coefficients" are clearly intended to be interpreted as part of all further references to "downmixing" in the specification as well as the claims. The ordinary and customary definition of "downmixing" makes no prerequisite to the following of standard for the coefficients, as is evidenced by the attached reference of Rowlands et al (USPN 5946352) which defines downmixing as a "process of taking a 5.1 channel audio signal, and combining channels to present a 2 channel audio signal which retains the gross spatial content of the original" (col. 11, lines 39-42). Such net or overall spatial content retention is suggests that each of the spatial signals (L,R,Ls,Rs,C) are present, thus weighted by some coefficient or value, in the final combination, but not that these coefficients must follow any form of a standard. Klayman '976 also denotes a similar process of "'mixing' down" a multiple channel sounds into a two individual signals, wherein the mixing may involve simple relative gain adjustments of the mixed signals or adjustments in terms of time, phase, and amplitude, of individual signals during the final mixing process (col. 1, lines 31-36; col. 2, lines 15-25). Arguably, the phrasing of applicant's reference to downmixing, "guidelines for

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downmixing" in paragraph 0054 also suggests that these well-specified methods are not the only forms of downmixing, because, if downmixing was or could only be performed according to standards, "guidelines" or outlines of policy would not be necessary.

Accordingly, in regards to the applicant's reading of the claim term in light of the specification, it is respectfully submitted that that the features upon which applicant relies (i.e., the use of standardized coefficients) are not included in the broadest, reasonable interpretation of the language of the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. As defined by the presently submitted claim language, the mixing in the Klayman '976 reference meets the broadest reasonable interpretation of the claimed limitation "downmixing".

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the

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effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. **Claims 6-8** are rejected under 35 U.S.C. 102(e) as being anticipated by Klayman et al (USPN 5912976). Hereafter, "Klayman et al" will be referred to as "Klayman '976".

Klayman '976 teaches an audio enhancement system for outputting a multi-channel input through a two channel output arrangement. Figure 8 illustrates a preferred embodiment for processing and mixing multi-channel audio signals to achieve a surround sound experience from a pair of output signals. The provided input signals are the left and right channels (M_L, M_R), the center channel (C_{IN}), the left and right surround channels (S_L, S_R), and a bass channel signal (B) (col. 9, lines 3-8). Each input signal, excluding the bass channel, is applied through a pair of gain stages, each stage being parallel among the input channels. The right main channel is applied to gain stages (252, 290), the left main channel is applied to gain stages (254, 292), the center channel (C_{IN}) is applied to gain stages (256, 258), the left surround channel is applied to gain stages (260, 330), and the right surround channel is applied to gain stages (262, 334) (col. 9, lines 8-16 and 34-37, and col. 10, lines 1-7). The bass channel also includes a gain stage (336) (col. 10, lines 3-5). The gain applied by

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both of these sets of gains (252,254,256,260,262,336 or 290,292,258,330,334,336) or subsets thereof read on "adjusting an amplitude of at least one of X related spatial channels to create X adjusted spatial channels". The outputs of these gain stages are applied directly or through other circuitry to left and right mixers (280,284) which output two channel signals (col. 9, lines 17-67 and col. 10, lines 1-7). The components involved in this signal processing, including but not limited to the mixers (280,284), read on "downmixing the X adjusted spatial channels to M channels". The cited sets and possible subsets thereof, such as 5 or 6 channels mixed to two output channels, read on "X is an integer greater than 4 and M is an integer greater than 0 and less than X". The application of adjusted gains by (252,254,256,260,262,336 or 290,292,258,330,334,336) before application of the input signal to mixers 280,284, reads on "adjusting precedes downmixing".

Regarding **Claim 7**, Klayman '976 teaches that the processing performed by the modules (100), which includes the setting of gain coefficients (148), may be user-adjustable (col. 6, lines 51-61). Klayman '976 also teaches that the gains applied to a set of amplifiers is based on a user's preferences, and adjustment gain control signals are also applied to amplifiers (col. 9, lines 8-17 and col. 12, lines 32-41). Collectively, these teachings read on "adjusting is controlled by an end-user".

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Regarding **Claim 8**, the applicant has defined a "primary audio channel" as a "voice or dialog signal" and a "remaining audio channel" as all other channels that are not a voice or dialog signal. Klayman '976 specifically refers to the center channel as containing dialogue, which reads on "one of the X related spatial channels is a primary audio channel" (col. 4, lines 48-55). The other channels, such as the surround channels (S_L, S_R) read on "at least one of the other of the X related spatial channels is a remaining audio channel".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 1-2 and 4-5** are rejected under 35 U.S.C. 103(a) as being unpatentable over Klayman et al (USPN 5912976) as applied above, and in further view of Belar (USPN 2167062). Hereafter, "Klayman et al" will be referred to as "Klayman '976".

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Regarding **Claim 1**, Klayman '976 teaches an audio enhancement system for outputting a multi-channel input through a two channel output arrangement. Figure 8 illustrates a preferred embodiment for processing and mixing multi-channel audio signals to achieve a surround sound experience from a pair of output signals. The provided input signals are the left and right channels (M_L, M_R), the center channel (C_{IN}), the left and right surround channels (S_L, S_R), and a bass channel signal (B) (col. 9, lines 3-8). Each input signal, excluding the bass channel, is applied through a pair of gain stages, each stage being parallel among the input channels. The right main channel is applied to gain stages (252, 290), the left main channel is applied to gain stages (254, 292), the center channel (C_{IN}) is applied to gain stages (256, 258), the left surround channel is applied to gain stages (260, 330), and the right surround channel is applied to gain stages (262, 334) (col. 9, lines 8-16 and 34-37, and col. 10, lines 1-7). The bass channel also includes a gain stage (336) (col. 10, lines 3-5). Both of these sets of gains (252, 254, 256, 260, 262, 336 or 290, 292, 258, 330, 334, 336) or subsets thereof read on "at least N parallel gain stages, each gain stage having an input and an output, wherein each gain stage is individually driven at its input by only one of X related spatial channels". The outputs of these channels read on "each gain stage produces at its output an amplitude adjusted version of the only one of X related spatial channels". The cited sets and possible subsets thereof read on "N and X are integers, N is

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greater than 4, and X is one of equal to and not equal to N". The outputs of these gain stages are applied directly or through other circuitry to left and right mixers (280,284) which output two channel signals (col. 9, lines 17-67 and col. 10, lines 1-7). The components involved in this signal processing, including but not limited to the mixers (280,284), read on "a circuit that downmixes the outputs of the N parallel gain stages to M channels, wherein M is an integer greater than 0 and less than N".

However, each of a subset of the gain stages (252,254,258,260,262) is not "adjusted individually" as presently claimed, as at least amplifier pairs (252,254) and (260,262) are controlled by common control signals, M_{VOLUME} and S_{VOLUME} , respectively (Figure 80).

Accordingly, Klayman '976 does not specify:

- each gain stage having a gain adjusted independently of the gain of the other N-1 gain stages, wherein N is greater than 4

Belar discloses a gain control circuit for different signal channels wherein the gain of the channels may be controlled both independently and simultaneously.

Regarding **Claim 1**, Belar specifically discloses:

each gain stage (comprising 16 and 18) having a gain adjusted independently ("individually" contrasted with "together") of the gain of the other N-1 gain stages (comprising 16 and 20) (col. 1, lines 0-15 and 29-34; col. 2, lines 5-30),

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wherein N is greater than 4 (single pair of input channels (12,13), in view of application of gain control (16,18,20) to each of two pairs of input channels of Klayman '976 - M_L, M_R and S_L, S_R - along with C_{IN} controlled by C_{VOLUME})

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate the individual and together gain stage (comprising 16,18,20) as taught by Belar in place of each of the two pairs of multipliers (252,254) and (260,262) in the system of Klayman '976. The motivation behind such a modification would have been that individual amplitude control for each channel in the pair would have enabled the sound image of sound sources common to the signals processed to be moved or panned by the user within the stereophonic field, as would have been recognized by one of ordinary skill in the art at the time of the invention. This position is substantiated by the teachings of Broadie (USPN 5394472), incorporated herein for evidentiary purposes, which teaches that left and right channels comprise common signals (col. 6, lines 49-52) and that relative amplitude volumes influence a sound's location or panning (col. 7, lines 1-8; col. 8, lines 49-55).

Regarding **Claim 2**, Figure 4 of Klayman '976 illustrates a processing enhancement module (100) that is part of an overall immersion processor (24), wherein the processing of the module is disclosed as user-adjustable to achieve a desired effect and or desired position or a reproduced sound (col. 6, lines 53-61). The

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processing includes the implementation of gain (148) based on the setting of multipliers. This processing parallels that shown for the pairs of signals in Figure 8, where the applied gains are disclosed as based on a user's preferences (col. 12, lines 32-41). The first stage of gains also receives volume adjustment signals (col. 9, lines 8-16). These teachings collectively read on "the N parallel gain stages are user-adjusted".

Regarding **Claim 4**, the provided input signals shown in Figure 8 include left and right channels (M_L, M_R), a center channel (C_{IN}), and left and right surround channels (S_L, S_R) (col. 9, lines 3-8). This reads on "the X related spatial channels are a left, right, center, right surround, and left surround channels of an audio program".

Regarding **Claim 5**, the provided input signals shown in Figure 8 include a low frequency effects signal B (col. 9, lines 3-8). This reads on "the X related spatial channels further include a low frequency effects channel of the audio program".

5. **Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over Klayman '976 as applied to claims 1-8 above, and further in view of Klayman (USPN 4748669). Hereafter, "Klayman" will be referred to as "Klayman '669".

As detailed above, Klayman '976 teaches a system for incorporating surround, multi-channel signal effects into a two output channel system. Klayman '976 discloses the technique of combining

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signals into a two channel format while only adjusting the relative gain ratios between the signals (col. 2, lines 15-19 and col. 12, lines 56-60).

Klayman '976 does not clearly specify:

- comparing the primary audio channel with at least the remaining audio channel to determine a ratio of the primary audio channel to the at least remaining audio channel
- automatically adjusting one of the audio primary channel and the remaining audio channel when a predetermined value for the ratio is not met

Klayman '669 discloses a stereo enhancement system for processing various versions of an input signal into an enhanced stereo output signal. One of the signals produced in the system is a sum signal (L+R), which Klayman associates with a "center stage" location, wherein the presence of a strong signal strength may indicate a center stage vocalist or instrumentalist in the reproduced audio (col. 13, lines 57-61 and col. 14, lines 28-32). In view of this description, this signal fits the applicant's definition of a "preferred signal", as is cited above. The other signals managed in the system are difference signals (L-R, R-L), which are known to influence the width or directivity of the stereo image (col. 2, lines 15-17). These signals are considered herein to meet the applicant's definition of "remaining audio" channels. In producing a two channel output,

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Klayman '669 employs a control circuit (30) for adjusting the stereophonic characteristic of the reproduced audio (col. 7, lines 49-57). This circuit (30) controls the gain of a gain amplifier (22), which outputs the difference signal (L-R), to maintain a constant ratio between the sum and difference signals and control the effects of reverberation (col. 12, lines 18-30). This control from the circuit (30) is based directly on the input of the sum and difference signals (col. 14, lines 44-48 and 61-64). The ratio between the sum and difference indicates the possible presence of reverberation (col. 12, lines 30-37). The assessment of this ratio reads on "comparing the primary audio channel with at least the remaining audio channel to determine a ratio of the primary audio channel to at least the remaining audio channel". This predetermined ratio is established by a potentiometer (39) (col. 16, lines 41-47). This predetermined ratio affects the CTRL signal output from the control circuit (30), which is applied to a gain controlled amplifier (22), which again, affects the gain applied to the difference signal (col. 16, lines 26-40). This application of a gain control signal, based on the ongoing input of the sum and difference signals reads on "automatically adjusting one of the primary audio channel and the remaining audio channel when a predetermined value for the ratio is not met".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate the gain adjustment circuit of Klayman '669 into the multi-channel processing circuitry of

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Klayman '976, wherein the sum signal of Klayman '669 is equated to the center channel of Klayman '976, and the difference signal of Klayman '669 is equated to at least the left and right channels of Klayman '976. Klayman '976 discusses the ratio of signals in the output signals; Klayman '669 discloses the control of this ratio, with the provided benefit being the control of the image of the reproduced audio. Alternatively stated, the processing circuitry of Klayman '669 would have provided a controlled balance between the center stage image and the signals which have the effect of widening the sound image.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,


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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is 571-272-7517. The examiner can normally be reached on Monday-Friday, 8:30 AM to 5:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Andrew Graham
Examiner
A.U. 2644


SINH TRAN
SUPERVISORY PATENT EXAMINER

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June 10, 2005